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AUTHOR Spencer, Mary L.; Henderson, Joan C.
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ABSTRACT

The Santa Fe Precision Teaching for Effective Learning, (PTEL) an ESEA Title III program, was selected as a remedial instructional approach to the performance and motivational problems of Santa Fe students. It proposed the following six major program objectives: (1) planning and implementation of start-up activities; (2) staff training in the charting of student correct and error frequencies in reading and math; (3) staff training in setting individual behavioral objectives and mastery criteria for students, and in concepts of the individualized management system; (4) training in reinforcement principles; (5) sequential ordering of behavioral objectives in the math and reading curricula; and (6) the attainment of Oakland Unified School District achievement score norms in math and reading by 60, 80, and 100 percent of PTEL students in program years one, two, and three, respectively. The evaluation demonstrated that five out of six objectives were accomplished by the program. Curriculum planning and development of materials were initiated by the staff at the beginning of the program and continued throughout the year. The staff generally felt that the inservice training provided was effective and adequately prepared them to implement PTEL methods in the classroom. Santa Fe PTEL failed to meet the predicted objective of 60 percent of its students achieving OUSD reading averages by approximately 10 percent and math averages by approximately 14 percent. The staff's reaction to the program's operation, administration, and organization was generally positive. (Author/BD)

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SANTA FE SCHOOL

PRECISION TEACHING PROGRAM

EVALUATION REPORT
1974 - 1975

TELEGRAPH DEVELOPMENT COMPANY
Berkeley, California

Mary L. Spencer, Ph.D. Joan C. Henderson

July 31, 1975

SP009 536

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SANTA FE PRECISION TEACHING PROGRAM

EVALUATION REPORT
1974 - 1975

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SANTA FE SCHOOL PRECISION TEACHING PROGRAM

EVALUATION REPORT
1974-1975

The Santa Fe Precision Teaching for Effective Learning Program, (PTEL), is a Title III-ESEA funded program operated by the Oakland Unified School District (OUSD) at Santa Fe Elementary School in Oakland. This program was selected as a remedial instructional approach to the performance and motivational problems of Santa Fe students. The 1973-74 achievement test results reported by the OUSD Research Department indicated that the average reading and math scores for Santa Fe students were below those of the OUSD in general. In addition, inadequate levels of student motivation for learning and school participation were inferred from the high rates of absenteeism and tardiness and from the high number of disciplinary office referrals which prevail at Santa Fe School.

The PTEL method was selected in part because it was judged to be compatible with certain factors in the Santa Fe community which are thought to be associated with academic difficulties. The community surrounding Santa Fe School, located at 915 54th Street in Oakland, is believed to have a high rate of residential and school relocation. These factors are thought to create academic difficulties for Santa Fe School students. Moreover, the Santa Fe School community is also a community in which many low income families reside. Although the unemployment rate is high, common occupations include clerical work, construction work, and longshore labor. A high percentage of the families

are receiving welfare assistance, while approximately 80 percent of the students at Santa Fe are in the free lunch program.

Santa Fe School was built approximately 20 years ago. It is a structure which encompasses two buildings that are divided by an asphalt playground. The main building is a two-story structure with small classrooms on each floor, a library on the second floor, and the school office and cafeteria situated on the first floor. In addition, there is an old, small building behind the main school building, which has several small classrooms. Classroom space is also provided by several portable buildings. The classrooms are generally light and pleasant, given the spatial conditions, and adequately house an enrollment of approximately 550 students.

All classes at Santa Fe have close to the upper limit of children per class size as set by the district (about 30 each). In the last three years, the school has received additional money from Title I and Title III. It is a Compensatory Education school, an Early Childhood Education school, and has also had a Guaranteed Learning Program for the last three years. These extra funds have provided two resource teachers and an early childhood education coordinator. These three people have become circuit chairmen for different grades. They coordinate activities and act as resource people to Grades K, 1 & 2, 3 & 4, and 5 & 6, respectively. The Project Director of the PTEL program works very closely with these resource persons and the Principal in an effort to coordinate the various programs at Santa Fe School.

Precision Teaching for Effective Learning (PTEL) is a specific instructional innovation. The PTEL method consists of a highly structured, diagnostic-prescriptive form of individualized teaching. Precision teaching consists of a growing set of procedures that guide teachers and learners in finding combinations of environmental events which affect the learner's performance. It is important to point out that Precision Teaching is not a specific method of teaching, nor a version of behavior modification. Precision Teaching is a way to plan, use, and analyze any teaching technique or method. It requires that teachers be taught how to diagnose each student's level of mastery of specific reading and math learning objectives, how to prescribe the subsequent learning activities appropriate for each child, and how to continuously evaluate each student's progress toward the specified learning objectives.

> "The history and fundamentals of precision teaching can be traced to the operant conditioning work of B. F. Skinner in the 1940s and '50s. The concept of "rate" as universal datum was probably Skinner's greatest contribution to precision teaching. The entire notion of precision teaching, as it is known today, was initiated by Ogden R. Lindsley in about 1965 at the University of Kansas. It was Dr. Lindsley's intent to refine and extend the techniques of operant conditioning and behavior modification so they could be used in measuring performance change in both social and academic behavior. Since the mid sixties, through the efforts of Lindsley, Kunzelmann, Koenig and others, much has been done in implementing the principles of precision teaching, not only in special education classrooms, but also in the regular class. For example, much of today's research uses the charting techniques developed under the precision teaching movement."[1]

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1 Berk, Ray. "Progress Report 1 -- 1973-74 of an ESEA Title III Project entitled Educational Remediation for Children with Learning Deficits Through Precision Teaching", Great Falls, Montana.

This approach to learning was considered for use at Santa Fe approximately four years ago. Several teachers had taken Precision Teaching workshop courses and developed an intense interest in this approach. A proposal was written for funding and the school received funds from the State of California to operate this program for the first year in 1974-75. Approximately one-half of the classes at Santa Fe School are involved in this project which includes 10 certified teachers and 10 part-time assistants with approximately 234 students.

The program's proposal specified a series of six major program objectives as follows:

- Planning and implementation of start-up activities.
- Staff training in the charting of student correct and error frequencies in reading and math.
- Staff training in setting individual behavioral objectives and mastery criteria for students, and in the general concepts of the individualized management system.
- Staff training in reinforcement principles.
- Sequential ordering of behavioral objectives in the math and reading curricula.
- The attainment of OUSD achievement score norms in math and reading by 60, 80 and 100 percent of PTEL students in program years 1, 2, and 3 respectively.

Telegraph Development Company undertook the evaluation of the Santa Fe Precision Teaching for Effective Learning Program with the goal of assessing each of the program objectives. Specifically, the evaluation strategy was comprised of five major objectives, as outlined in the Statement of Work:

- Verify Start-up Planning and Implementation--

  Each PTEL start-up activity is linked in the program proposal to specific calendar deadlines. Telegraph Development Company will establish the actual dates of activity accomplishment and determine the factors which have contributed to the actual timing achieved. This will be accomplished through interviews with the program director and teacher questionnaires.

- Verify Staff Development--

  Program in-service testing results will be examined and the program director will be interviewed in order to validate program compliance with stated staff development objectives. In addition, teacher questionnaires will probe teacher views regarding the adequacy and effectiveness of the various in-service training procedures.

- Verify Curriculum Development--

  The development of behavioral objectives for the math and reading curricula will be assessed via an examination of the behavioral objective structures developed by Santa Fe PTEL staff. Views regarding the adequacy and effectiveness of these curricula structures will be probed in interviews with the program director and in the teacher questionnaires.

- Assess and Analyze Student Growth in Math and Reading Achievement--

  Indices of growth on State-adopted standardized achievement tests in math and reading will be analyzed comparatively to determine the impact of the PTEL program at each grade level on Santa Fe's PTEL students relative to Santa Fe's non-PTEL students, relative to non-PTEL students in a control school, and relative to OUSD in general. The effects of varying degrees of student tenure in PTEL will be assessed in the longitudinal treatment of scores in subsequent program years. The data analysis design and procedures underlying student achievement comparisons are specified in the work statement.

- Examine Preliminary Indices of Student Motivation--

  Changes in the frequency of student attendance, tardiness, and disciplinary office referrals will be used to gauge the impact of PTEL on student motivation for learning and school participation.

METHOD

Students

There are three groups of student populations to be described as follows: The Treatment Group (Santa Fe PTEL Students), the Control Group I (Santa Fe Non-PTEL Students), and Control Group II (Non-Santa Fe, Non-PTEL Students).

Santa Fe PTEL Students: Approximately 234 students participated in the PTEL program. The ethnic breakdown is approximately 98 percent Black, while the other 2 percent are characterized as Asian American, Filipino, Spanish surname, and Native American. Achievement scores for 1973-74 students in reading and math indicated that all grade levels were below average, ranging from five months to one year and seven months below grade level in reading, and from two months to one year and seven months below grade level in math. As previously stated, the students at Santa Fe come from predominantly low-income families, many receiving welfare assistance, and 80 percent of the population are in the free lunch program. Students were selected for the PTEL program according to their placement in the classrooms of teachers who opted to participate in the program. This placement of students was performed by the principal at Santa Fe School without prior knowledge of which Santa Fe teachers would participate in the PTEL program. The grade levels that composed the PTEL population were as follows: one Kindergarten class, one K, 1, 2 combination class, one Grade 1 class, one 1, 2, 3 com-

bination class, one Grade 3 class, one Grade 4 class, one 4, 5 combination class, one Grade 6 class, and one EMR and one EH class.

Control Group I: Approximately 316 students made up the population of Control Group I. As previously stated, about one-half of Santa Fe School's student population participated in the PTEL program; consequently the other half of this school's population constituted Control Group I. The ethnic breakdown, the academic achievement level, and the socio-economic level is generally the same for this Control Group I and the Treatment Group. Again, students were randomly selected for this Control Group by the Principal as a result of classroom placement. The grade levels that composed the Control Group I population were as follows: Two Kindergarten classes, one 2,3 combination class, one Grade 3 class, two Grade 4 classes, one Grade 5 class, one 5, 6 combination class, and two Grade 6 classes.

Control Group II: Because of the possibility that Control Group I was influenced by its proximity to the PTEL classrooms, a second Control Group was constituted by selecting another OUSD school with demographic and skill characteristics similar to those of Santa Fe School.

Approximately 534 students participated in Control Group II. This included a total school population with grades Kindergarten through sixth. This particular school was selected as a second control group because of the similar ethnic and socio-economic characteristics as well as academic achievement levels. Spe-

cifically, the ethnic breakdown is approximately 95 percent Black, while the other 5 percent are characterized as Asian-Americans, Spanish surname, Native American, and other White. Achievement scores for 1973-74 students in reading and math indicated that most grade levels were below average, ranging in reading scores from one month to two years and three months below grade level, and ranging in math scores in the first grade from one month above grade level to one year and seven months below grade level in the sixth grade. The students come from predominantly low-income families as the school is identified as a Compensatory Education School. Several other aspects of this school are similar to those of the Treatment Group. The school personnel included three resource teachers and 20 part-time instructional assistants. In that the funding and support services at this school were similar to those of Santa Fe School, we assume that many variables involved in the educational process (other than the treatment variables) were closely related. Control Group II was identified at the end of the program year for comparison purposes. It should be pointed out that neither of the Control Groups constitute true control groups for this study, because neither they nor the PTEL group were created by random assignment. However, Control Group II may be considered an adequate comparison group because of its demographic and skill level similarities to Santa Fe and because it has no PTEL program in operation.

Program

The PTEL program began operation in September, 1974 and continued through the regular school year until June, 1975. The program was administered by a Project Director under the direct supervision of the Santa Fe School Principal. The staff included 10 certified teachers, 10 part-time assistant teachers, and one part-time clerk. The Project Director was responsible for overall supervision and organization of program activities, coordination and development of training materials and curriculum, the conduct of in-service training for staff and parent workshops, and coordination of the PTEL program with other school programs and support services. The teachers were responsible for implementing the PTEL methods in their classrooms, supervising their assistant teachers, and participating in the PTEL in-service training program. The assistant teachers were hired for six hours a day to assist teachers with instructional groups of students, to give timed tests, to chart student progress, to prepare drill sheets, and for general student record keeping. All personnel hired for the program were interviewed by teams of teachers, parents, and administrators. Teachers voluntarily participated in the program. Because 10 teachers were needed for the program, all teachers at Santa Fe School had an equal opportunity to participate if they so desired. The first teachers choosing to participate were selected and the remaining teachers at the school became a part of Control Group I.

The PTEL in-service training workshops began in September for teachers and assistants and continued weekly until May, 1975.

In addition, several weeks of workshops were held in June, 1975 after school was out, for the purpose of assessing student progress and for developing additional curriculum materials. The in-service training program was implemented throughout the school year. It generally consisted of instruction in the following areas: 1) pinpointing behavioral objectives for children and establishing mastery criteria for an individualized management system; 2) charting correct and error frequencies; and 3) identifying effects of reinforcement and punishment. Training was conducted primarily by the Project Director with the assistance of various consultants (e.g., consultants in math, precision teaching and behavior modification. Techniques used to teach these basic concepts included the use of learning centers, reading materials, problem-solving materials, games, and direct instruction by the Project Director.

The staff was given three separate tests at the completion of training segments in order to evaluate their knowledge of PTEL teaching methods. These tests were reviewed and scored by the Project Director to document the teachers' abilities to implement the PTEL program.

PTEL instructional approaches may encompass either a fairly *traditional* whole-class focus or the more student-determined *individualized* classroom concept. Individualized instruction was more apparent in the PTEL classrooms because teachers and assistants devoted considerable energy to obtaining a timed sample of student performance everyday in order to monitor student progress. This allowed teachers to make appropriate instructional decisions on

a daily basis for each student. Generally, only reading, language arts, and math were taught via the PTEL approach, (i.e., daily timed testing and charting). In addition to this, the PTEL classes had assistant teachers for six hours a day while non-PTEL classes at Santa Fe had assistants for three hours per day. Again, this arrangement allows more individualized and small group instruction. Most of the PTEL students were able to test themselves or one another and to chart their own progress. The exception existed in the Kindergarten, EMR, EH, and some first grade classes. The students in these classes were simply not able to chart. Different, less difficult charts, will be used next year, so that all students can chart their own progress.

As PTEL instructional approaches varied from class to class, so did the use of instructional materials. The McGraw—Hill reading program was primarily used in grades K-3. The Houghton-Mifflin materials were used primarily in grades 4-6. In addition, teachers reported using S.R.A. workbooks, Flesh word lists, Ginn Language, Peabody Language Kits, Hayes Afro-American Reading, and many teacher-made materials. Project Mathematics, a manipulative-based program, was the primary mode of math instruction. In addition, teachers reported using S.R.A. materials, Commercial Drill and Practice Games, Wirtz Workbook, tapes, film loops, and many teacher-made worksheets and drill practice games.

Instruments

Two instruments, the Staff Survey Form and Project Director Questionnaires, were developed to obtain the opinions of PTEL

staff and their recommendations for future program approaches and activities. In addition, three standardized tests were identified for the PTEL program evaluation. These are State of California designated standardized tests used for all OUSD elementary schools.

Staff Survey Form: Staff descriptions and judgements regarding 1) program operations, 2) individualized teaching approaches, 3) educational impact, 4) in-service training program, 5) parental involvement, and 6) program needs,were elicited by a self-administered confidential questionnaire. In addition, the evaluator held small group interviews with teachers to clarify responses and to gain additional information. The Staff Survey Form is presented in Appendix A.

Project Director Questionnaire: The Project Director was interviewed by the evaluator. A questionnaire was developed for this purpose which included inquiries regarding 1) the dates of accomplishment for stated program activities, 2) issues related to staff development, 3) the curriculum development process, 4) parental involvement, 5) program impact, and 6) program needs. The Project Director Questionnaire is presented in Appendix B.

Tests of Basic Experiences (TOBE): This test, Levels K & L, is made up of Mathematics, Language, Science, Social Studies, and General Concepts Scales. OUSD administered the TOBE to Kindergarten students. These students took only two parts of the test, Language and Mathematics. Specifically, the test attempts to determine a child's mastery of fundamental mathematical concepts, basic language concepts, such as vocabulary, sentence structure, verb tense, sound-symbol relationships, and letter recognition.

Cooperative Primary Tests: This instrument probes six academic areas: Pilot test, Listening, Word Analysis, Mathematics, Reading and Writing Skills. There are four forms of this test: 12 A, 12 B, 23 A, and 23 B, which were administered to students in Grades 1, 2, and 3. Students in the evaluation study, took only two parts of the test battery: Reading and Mathematics. The Reading section includes words, sentences, and paragraphs which must be read. The Mathematics section attempts to measure major math concepts in their emergent state; e.g., number, symbolism, operation, function and relations, approximation and estimation, proof, measurement, and geometry.

Comprehensive Tests of Basic Skills (CTBS): This test is composed of four sections: Reading, Language, Arithmetic, and Study Skills. It was designed to systematically measure those skills prerequisite to studying and learning in subject-matter courses. Students in Grades 4, 5, and 6 took three of the sections: Reading, Language, and Arithmetic. Alternate forms of the test used were Q_1, Q_2, and R_2. Specifically, the Reading test includes vocabulary and comprehension. The Language test includes mechanics, expression, and spelling. The Arithmetic test includes computation, concepts, and applications.

Table 1 summarizes the instruments, forms, levels, and dates of administration for the pre- and post- tests utilized in the evaluation.

TABLE 1 STANDARDIZED TESTS ADMINISTERED TO STUDENTS

SCHOOL	GRADE	TEST	PRE-TEST FORM ADMINISTERED	POST-TEST FORM ADMINISTERED
Santa Fe	K	TOBE	Level K	Level L
Washington	K	TOBE	Level K	Level L
Santa Fe	2	CO-OP	Form 12 B	Form 23 A
Washington	2	CO-OP	Form 12 B	Form 23 A
Santa Fe	3	CO-OP	Form 23 A	Form 23 B
Washington	3	CO-OP	Form 23 A	Form 23 B
Santa Fe	4	CTBS	Form Q_1	Form Q_1
Washington	4	CTBS	Form Q_1	Form Q_1
Santa Fe	5	CTBS	Form R_2	Form R_2
Washington	5	CTBS	Form R_2	Form R_2
Santa Fe	6	CTBS	Form Q_2	Form Q_2
Washington	6	CTBS	Form Q_2	Form Q_2

(Grade 1 only took the test in the Spring, 1975; therefore, no analysis of these test scores was done.)

RESULTS

Staff Survey Form: The Staff Survey Form generally disclosed positive teacher reactions and judgements program activities and outcomes. Teachers were asked to rate students' progress as a result of utilizing the PTEL methods in the classrooms during the 1974-75 school year. Table 2 shows some areas in which teachers rated math progress most highly. It also reveals some areas in which teachers specifically felt that improvement was needed. As can be seen in Table 2, teachers felt that the greatest improvement occurred in math readiness, counting, and in addition-subtraction with whole numbers. In the areas of measurement and application, problem solving, estimation and averages, and ratios, teachers generally felt that improvement was needed.

The overall rating of teachers' judgement of student progress in mathematical areas was +85. The calculation used was Greatly Improved (+2), Somewhat Improved (+1), and Little or No Change / Improvement Needed (-2).

Teachers' opinions of students' progress in reading areas indicate a great improvement particularly in the area of word analysis, reading comprehension, and language arts. Vocabulary development was indicated as an area that needed more improvement. Table 3 displays some of the areas of student progress in reading as judged by the teachers.

TABLE 2 TEACHER JUDGEMENT OF STUDENT PROGRESS IN MATH

	GREATLY IMPROVED	SOMEWHAT IMPROVED	CHANGE NOT NECESSARY*	LITTLE OR NO CHANGE/IMPROVEMENT IS NEEDED
Math readiness, counting	7	1	1	0
Addition, subtraction with whole numbers	7	3	0	0
Structure & properties (greater, less than, or equal)	2	8	0	0
Multiplication, division with whole numbers	3	6	0	0
Fraction concept	2	6	0	0
Geometry, recognition of shapes	3	2	1	2
Measurement & application (time, size, temperature)	1	4	0	4
Problem-solving, estimation, averages, ratio, weight, etc.	0	2	0	3

* Teachers not reporting a change in an area on the table indicated that this concept was not applicable to their grade .

TABLE 3 TEACHER JUDGEMENT OF STUDENT PROGRESS IN READING AREAS

	GREATLY IMPROVED	SOMEWHAT IMPROVED	CHANGE NOT NECESSARY*	LITTLE OR NO CHANGE/IMPROVEMENT IS NEEDED
Sight recognition of whole words	8	1	0	0
Consonants	7	2	1	0
Word Origins	0	2	0	3
Crossword puzzle skill	0	2	0	3
Following simple directions	5	5	0	0
Determining author's motive	1	1	0	5
Understanding riddles	3	0	2	3
Spelling	6	2	0	2
Listening skills	1	6	0	3
Creative writing	2	4	0	3

* Teachers not reporting a change in an area on the table indicated that this concept was not applicable to their grade.

The overall rating of student progress in reading areas was +200 using the calculation mentioned above. Teachers' opinions differed for which group of students (below grade level, at grade level, or above grade level) profited most from the PTEL approach, but most agreed that it has helped to enhance students' positive self-concept. Some teachers felt that they were more effective using the PTEL approach in teaching mathematics, and others felt spelling skills showed the greatest improvement with PTEL methods.

Teachers generally agreed that the program administration was effective and responsive. Table 4 shows some of the areas of administration and organization as judged by teachers.

TABLE 4 TEACHER JUDGEMENT SCORE FOR ADMINISTRATION & ORGANIZATION

	STRONGLY AGREE	SOMEWHAT AGREE	DISAGREE SOMEWHAT	STRONGLY DISAGREE
Program was well planned	5	3	1	1
Program goals are realistic	5	2	2	1
The staff gets along well with Project Director	9	1	0	0
Project Director is responsive to staff needs	7	9	0	0
Program is well coordinated with other services within the school	2	6	0	1
Staff has been able to effectively evaluate the program and institute changes on an on-going basis	4	6	0	0

Overall, the staff rated administration and organization as +73. Calculations used were Strongly Agree (+2), Agree Somewhat (+1), Disagree Somewhat (-1), and Strongly Disagree (-2). The Project Director indicated that most dates for objectives relating to curriculum planning were met. More discussion related to this will follow.

In the area of staff development, teachers also agreed that the in-service training provided was effective and that it adequately prepared them to implement PTEL methods in the classroom. Although the teachers were generally positive about the training, most felt that they did not actually begin to effectively implement PTEL in the classroom until December or January. They were

particularly responsive to the consultants that participated in the training workshops. One consultant, Ms. Beth Willis, was mentioned by most staff members as being outstanding and particularly helpful to teachers in their attempt to implement Precision Teaching in the classroom in various subject areas. Teachers also universally agreed that more in-service training is needed for the coming program year. Table 5 below shows some of the areas of staff development as judged by the teachers.

TABLE 5 TEACHER JUDGMENT SCORE FOR STAFF DEVELOPMENT

	STRONGLY AGREE	SOMEWHAT AGREE	DISAGREE SOMEWHAT	STRONGLY DISAGREE
The training developed specific skills and knowledge that related closely to what teachers needed to implement the Precision Teaching Program	5	4	0	1
Because of the training, teachers are well prepared in the following areas:				
Clearly understanding the individual management system	4	4	1	0
Charting the frequency of correct or error answers.	8	1	0	0
Setting behavioral objectives for each student.	4	4	1	0
Setting mastery criteria for each student	5	8	0	1
Staff effectively planned the Precision Teaching Program and cooperatively implemented it.	6	2	0	1

Overall, the staff rated the in-service training as +147 (utilizing the same calculation mentioned above).

The Project Director indicated that training in the behavior incentives approach, or behavior modification, was held very late in the year (April) and was never really implemented this year to a full extent in the classrooms. Two workshops were held in this area and many of the techniques learned will be tried next program year.

In addition, specific student objectives were identified as a result of teacher assessment of students at the beginning of the year (primarily by teacher-made diagnostic tests). Although students generally progressed through materials in a sequential order, specific behavioral objectives with long-term goals and acceleration rates were not established for students.

Teachers were asked their opinions regarding the use of PTEL methods in their instructional approach with students. They were positive in their judgements, feeling that it is an optimum approach to improving students' reading and math ability. Some felt that this approach made it easier for a student to understand why he/she might need more drills in certain areas and that he/she is competing with "self". Some felt that the individual approach affected classroom management positively. In addition, teachers judged the instructional assistants as being very helpful in the classroom. Teachers did indicate that although most students were charting their own progress, the task was difficult because of the complex nature of the chart format. A different form is planned for use next program year.

Table 6 shows some of the teachers' judgements of PTEL as an instructional approach.

TABLE 6 TEACHER JUDGEMENT SCORE FOR PTEL AS AN INSTRUCTIONAL APPROACH

	STRONGLY AGREE	SOMEWHAT AGREE	DISAGREE SOMEWHAT	STRONGLY DISAGREE
Precision Teaching is the optimum approach to improving a student's reading ability	5	4	0	1
Precision Teaching is the optimum approach to improving a student's mathematical abilities.	6	3	0	1
There is sufficient time in the Precision Teaching program to plan weekly activities.	3	4	3	0
Precision Teaching allows me to teach individual students better.	8	2	0	0
The recording, charting, and prescribing are not unduly burdensome.	3	6	1	0
The instructional assistants were very helpful in the following ways:				
conducting small group or individual student activities	7	2	0	0
charting student progress.	9	0	0	0
Students were capable of learning to utilize Precision Teaching instruments effectively.	3	7	0	0
Precision teaching has increased teachers' enthusiasm about teaching math and reading	5	5	0	0

The overall rating was +182 utilizing the same calculations as mentioned above.

The Project Director indicated that the PTEL approach involves the student in his own learning process; e.g.,progressing at his individual pace, making decisions for himself, testing and charting his progress, etc. This allows the student to become aware of his/her learning objectives which can provide a personal incentive and consequently, can motivate the student to improve his/her academic abilities.

It was felt that the PTEL approach allows teachers to observe students' progress on a daily basis and therefore, enables teachers to more accurately know those areas in which the child needs help.

Teachers' opinions relating to the adequacy of instructional materials differed greatly. Six teachers felt there were sufficient instructional materials for each student, while four did not. When asked if there were sufficient instructional materials of the type needed to implement the PTEL method, five answered "yes" and five teachers answered "no". Some teachers indicated a need for more materials to teach functions and geometry, appropriate math manipulations, and subject area materials such as Black history, social science, and science. Overall, teachers judged teacher-made worksheets, drill and practice games, and other teacher prepared materials as the most effective instructional materials used to teach reading and math.

Teachers reported that approximately 60 parents visited or volunteered in their classes during the school year. In addition, each teacher stated that two to three parent-teacher conferences per child were held during the year and most felt

the conferences were more effective as a result of the PTEL program. Some stated that the approach enabled them to present a clear picture of a child's progress to the parent.

There were two parent workshops held during the year, conducted by the Project Director. The PTEL program was explained to the parents and some practiced the testing and charting themselves. At the end of the year, a film was planned for the children on the night parents visited the classrooms. This approach proved to be effective in stimulating parent attendance.

The staff generally felt that the limited number of participating parents were interested in, and were generally positive about, the PTEL program, but the quantity of parental involvement was insufficient. The staff has various plans formulated to improve parental involvement next year, eg. home visits, field trips, telephone calls, notes home, etc.

As previously stated, Santa Fe School has experienced high rates of absenteeism and tardiness, as well as a high number of disciplinary office referrals. It has been inferred that inadequate levels of student motivation for learning and school exist because of this. One of the objectives of the PTEL approach is to facilitate student learning and motivation. Teachers were asked their opinions regarding student attitudes and motivation. Table 7 shows their responses to be very positive. Most felt that students' feelings about their reading and math skill abilities had greatly improved.

TABLE 7 STUDENT MOTIVATIONAL AND ATTITUDINAL CHANGES

	GREATLY IMPROVED	SOMEWHAT IMPROVED	CHANGE NOT NECESSARY	LITTLE OR NO CHANGE/IMPROVEMENT IS NEEDED
Indicate your students' growth in the following areas:				
Your students' pleasure in reading	5	4	0	1
Your students' use of library	3	6	0	0
Your students' feelings about their own reading abilities	9	1	0	0
Your students' appreciation of reading skills in others	6	4	0	0
Your students' feelings about their own math skills	6	4	0	0
Your students' appreciation of math skills in others	6	4	0	0
Your students' attendance and tardy rates	3	3	2	2
Frequency of conflicts & negative behavior exhibited by students	6	2	0	1
Your students' performance on daily homework assignments.	1	2	1	3

Student Attendance and Office Referral: The evaluator also examined preliminary indices of student motivation to see if there was a change in the frequency of student attendance, tardiness, and disciplinary office referrals. Table 8 shows an absenteeism trend from September, 1974 through June, 1975. As can be seen, more students were absent the second half of the school year than in the beginning, with the month of January showing the highest number of students absent and the highest total number of absences per month.

TABLE 8: ABSENTEEISM DATES OF SANTA FE STUDENTS 1974-75

	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
# OF STUDENTS ABSENT 1 DAY OR MORE	61	107	96	91	132	117	111	114	111	58
TOTAL # OF ABSENCES	154	274	213	224	381	320	317	323	274	120

Table 9 shows student tardy rates, for both Santa Fe PTEL students and Santa Fe non-PTEL students. A sample of 35 students was pulled from both groups and recorded. As can be seen, there was a lower number of tardies in each month for non-PTEL students. Again, the month of January has the highest number of tardies for both groups. The month of January also had the highest number of absences.

TABLE 9 SANTA FE STUDENT TARDY RATES (SAMPLE OF 35 FROM EACH GROUP)

	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
# of Tardies Santa Fe PTEL Students	14	8	6	9	19	14	17	9	11	4
# of Tardies Santa Fe Non-PTEL Students	2	4	3	7	8	5	5	3	6	1

Table 10 shows the number of office referrals for disciplinary reasons for Santa Fe PTEL students. This is based on a 10 percent sample (30), pulled from all office referrals of PTEL students. There appears to be no trend established.

TABLE 10 SANTA FE PTEL STUDENT OFFICE REFERRALS FOR DISCIPLINARY REASONS (30 IN THE SAMPLE)

	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
# of Office Referrals	0	5	1	4	1	4	1	5	4	2

(There were 3 Office Referrals with no date)

Student Behavior Charts: As the PTEL program is designed to move children through sequentially ordered behavior objectives, summary charts were developed by the staff for each student at the end of the program year. The data was summarized from each student behavior chart, developed to show student progress in Math and Reading concepts. As previously stated, the Starlin's Curriculum Ladder was used, which contains sequential mathematical behaviors through which students progressed. The behavior bank contains Inventories which designate mathematical curriculum

changes. For example, "Inventory I - Our students will be able to compute accurately and efficiently - multiply x 0 to x 9". Each inventory contains items through which a student moves sequentially. For example, "Item #301 - multiply x 0 to x 1". For purposes of summarizing student progress in math, the staff counted the number of items on the curriculum ladder through which each student progressed. This data was summarized and can be seen in Table 11. Progress in reading was more difficult to summarize, as students used varying materials at different levels. For instance, it can be seen on Table 11 that EMR students on the average, mastered 7.1 sounds or letters. Kindergarten students achieved, on the average, 2.8 reading objectives. These include knowledge of the alphabet, rhyming words, hearing consonants, matching words, and reading words. First, second, and third grade students completed, on the average, 3.3 Sullivan Programmed Readers or 1.6 Sullivan Storybooks. Students in the fourth, fifth and sixth grades completed 14.1 units in the Houghton-Mifflin Reading Series, or 8.7 units in the Kottmeyer +4 Series. It can be seen from Table 11 that the number of actual weeks of progress vary in math as well as reading. This was due to implementing the testing and charting at different times (in the classrooms and with individual students). Implementation decisions were made by the staff when they felt they were adequately enough trained in the PTEL approach to implement it in the classroom. In addition, certain students learned and understood the PTEL approach prior to others. Another factor to consider is the high transition rate at Santa Fe School. Some students enrolled later than others, and some transferred to other schools in the middle of the year.

TABLE 11 PTEL STUDENTS' PROGRESS IN MATH AND READING AS SUMMARIZED FROM STUDENT BEHAVIOR CHARTS [1]

EMR -- 13 STUDENTS -- MATH

Total actual weeks, range 2 to 22
average 14.0

Total number of items moved, range 7 to 35
average 15.0

EMR -- 13 STUDENTS -- READING

Total actual weeks, range 4 to 12
average 9.1 (Goldman Lynch)

Total number of sounds learned, range 2 to 8
average 7.1

Total number of S.R.A. Books completed, range 2 to 2
average 2

EH -- 6 STUDENTS -- MATH

Total actual weeks, range 9 to 35
average 18.5

Total number of items moved, range 2 to 142
average 67.8

EH -- NO DATA REPORTED -- READING

KINDERGARTEN -- 37 STUDENTS -- MATH

Total actual weeks, range 2 to 24
average 10.2

Total number of items moved, range 1 to 20
average 2.0

KINDERGARTEN -- 37 STUDENTS -- READING

Total number of weeks, range 2 to 31
average 17.5

Total number of reading objectives (as defined by teacher), range 1 to 6
average 2.8

[1] The Math and Reading items do not constitute an equal interval scale. Thus, acceleration over items must be interpreted with caution.

GRADES 1, 2, & 3 -- 116 STUDENTS -- MATH

Total actual weeks, range 4 to 32
average 19.4

Total number of items moved, range 1 to 102
average 30.4

GRADES 1, 2, & 3 -- 116 STUDENTS -- READING

Total actual weeks, range 2 to 25
average 10.8

Number of Sullivan Programmed Readers completed,
range 1 to 6
average 3.3

Number of Storybooks completed, range 1 to 4
average 1.6

GRADES 4, 5, & 6 -- 83 STUDENTS -- MATH

Total actual weeks, range 2 to 38
average 25.7

Total number of items moved, range 1 to 266
average 88.2

GRADES 4, 5, & 6 -- 22 STUDENTS -- READING

Total actual weeks, range 8 to 25
average 21.9

Total Houghton Mifflin units completed, range 9 to 15
average 14.1

Total +4 Reading Series units completed, range 4 to 12
average 8.7

Achievement Test Scores: Three different tests (TOBE, Co-op Primary, and the CTBS) were scored for the number of correct responses and all raw scores were then transformed into scaled scores. Scaled scores were used in order that comparisons could be made between all levels of each particular test utilized. Mean scaled scores were then computed for both pre- and post-tests on the basis of grade level and on the basis of test type (Grades K, 2 & 3; and 4, 5, & 6). In addition, gains were computed for all scores on the basis of scaled scores and mean gains were computed by grade level and by tests.

The statistical analysis of test scores included an Analysis of Variance of standardized gain scores by grade group. Considerable debate has occurred in educational research circles in recent years over the choice of appropriate procedures for analyzing educational change or gain (e.g., Cronbach & Furbey, 1970). Because the Santa Fe PTEL evaluation study is a clear example of the *non-equivalent control group design* in which group selection is not defined at the pretest, the standardized change score analysis was selected as advised by Kenny (1975). The level of statistical significance was defined at the .05 confidence level.

Comparisons were also made between the three groups--Santa Fe PTEL to Control Group I, Santa Fe PTEL to Control Group II, and the comparison of the two control groups. The T-Test was used where appropriate with the statistical significance

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Cronbach, L. E., and Furbey, L. How we should measure "change" -- or should we? Psychological Bulletin, 1970, 74, 68-80.

Kenny, D. A. A quasi-experimental approach to assessing treatment effects in the nonequivalent control group design. Psychological Bulletin, 1975, 82, 345-362.

defined as .05. In addition, an analysis was performed to determine the percentage of students in each school by grade level who met or were above the Oakland Unified School District (OUSD) averages. All analysis of scores was done in the areas of reading and math. The grade levels included in the data are K, 2, 3, 4, 5, and 6. Grade 1 was excluded as only post-test scores were available.

Table 12 reveals the pre- and post-test mean scores by grade level for all these groups in reading. As can be seen, the Santa Fe PTEL students in Kindergarten and Grade 3 scored higher on the post-test than did the two control groups. The Santa Fe PTEL students in Grade 4 had higher post-test scores than did Control Group I. When pre-tests are considered, PTEL Kindergarten and Grade 4 students scored slightly higher than either of the control groups. In all other grades, the control groups scored higher on the post-tests.

Table 13 reveals pre- and post-test mean scores for math by grade level for all three groups. As can be seen, Grades K and 4 in Santa Fe PTEL, scored higher on the post-test than did either of the Control Groups, but also had higher pre-test scores. The Grade 3 Santa Fe PTEL students scored higher on the post-test than Control Group I did, but again the pre-test mean scores were also higher.

TABLE 12 MEAN SCORES FOR READING BY GRADE LEVEL FOR PRE- AND POST-TEST

GROUP	GRADE	PRE-TEST	# OF STUDENTS	POST-TEST	# OF STUDENTS
Santa Fe PTEL	K	44.917	24	62.083	24
	2	135.200	10	143.300	10
	3	144.650	40	152.282	39
	4	349.793	29	381.896	29
	5	353.636	11	387.364	11
	6	398.174	23	423.869	23
Control Group I	K	43.478	23	57.609	23
	2	134.771	35	143.162	37
	3	139.333	27	145.852	27
	4	318.739	23	372.000	23
	5	372.864	59	411.896	58
	6	424.947	75	448.773	75
Control Group II	K	44.554	74	59.863	73
	2	136.511	47	144.087	46
	3	145.982	57	151.929	56
	4	344.486	37	397.919	57
	5	358.717	60	402.508	61
	6	411.980	50	442.784	51

TABLE 13 MEAN SCORES FOR MATH BY GRADE LEVEL FOR PRE- AND POST-TEST

GROUP	GRADE	PRE-TEST	# OF STUDENTS	POST-TEST	# OF STUDENTS
Santa Fe PTEL	K	44.875	24	58.417	24
	2	131.667	3	144.100	10
	3	142.974	39	150.575	40
	4	334.172	29	375.286	28
	5	337.700	10	343.000	11
	6	391.522	23	416.174	23
Control Group I	K	44.652	23	58.043	23
	2	132.824	34	147.838	37
	3	138.704	27	148.111	27
	4	312.823	17	345.167	12
	5	356.421	57	395.776	58
	6.	422.213	75	461.432	74
Control Group II	K	43.770	74	56.784	74
	2	135.553	47	146.468	47
	3	142.034	58	153.684	57
	4	327.588	34	373.757	37
	5	370.633	49	405.780	59
	6	413.909	44	442.479	48

Table 14 shows at the Kindergarten level that the three groups did not differ reliably in reading achievement. As displayed, Santa Fe PTEL had a mean gain in TOBE reading scores of 17.17, while Control Groups I and II obtained mean reading gain scores of 14.13 and 15.33, respectively ($F(2,117) = 1.01$, $p = .37$). The three groups at Grades 2 and 3 on the Co-op Primary do not differ significantly in reading achievement. Santa Fe PTEL had a mean gain of 7.61, while the two Control Groups achieved mean reading gain scores of 7.53 and 6.50, respectively ($F(2,209) = 0.61$, $p = .55$). There was a significant difference in mean reading gains in Grades 4, 5, and 6 on the CTBS. Santa Fe PTEL had a mean gain score of 30.04, Control Group I had a mean gain score of 33.73, and Control Group II had a mean gain score of 43.36 ($F(2,361) = 3.65$, $p = .026$). Control Group II did significantly better than Control Group I ($T(361$ df$) = 2.19$, $p < .029$), and Santa Fe PTEL ($T(361$ df$) = 2.32$, $p < .021$).

Table 14 also indicates that the Kindergarten groups do not differ reliably in mean math scores. As can be seen, Santa Fe PTEL had a mean gain in TOBE math scores of 13.54, while Control Group I and II obtained mean math gain scores of 13.39 and 13.01, respectively ($F(2,118) = .05$, $p = .38$). Grades 2 and 3 do differ significantly in mean math gain scores on the Co-op Primary. Santa Fe PTEL had a mean math gain score of 7.14, while Control Groups I and II had mean scores of 12.98 and 11.27, respectively ($F(2,204) = 6.78$, $p = .002$). Both Control Groups achieved more gain than did Santa Fe PTEL. Santa Fe

PTEL differed reliably from Control Group I (T(204df) = 2.822, $p < .005$), and Santa Fe PTEL was statistically different from Control Group II (T(204df) = 3.634, $p < .000$). Mean math gain scores (CTBS) do not differ reliably between groups. Santa Fe PTEL had a mean math gain score of 30.34, Control Group I had a gain score of 38.85, and Control Group II had a mean math gain of 34.65 (F(2,320) = 1.66, $p = .19$).

TABLE 14 MEAN SCALE SCORE GAINS FOR READING AND MATH

GROUP	GRADE	TEST	READING SCALE SCORE GAIN			MATH SCALE SCORE GAIN		
			M	SD	N	M	SD	N
Santa Fe PTEL	K	TOBE	17.166	7.00	24	13.541	5.67	24
	2 & 3	Co-op Primary	7.612	7.15	49	7.142	8.15	42
	4, 5, & 6	CTBS	30.047	34.65	63	30.344		61
Control Group I	K	TOBE	14.130	3.86	23	13.391	6.73	23
	2 & 3	Co-op Primary	7.532	5.69	62	12.983	8.41	61
	4, 5, & 6	CTBS	33.730	38.68	156	38.858		141
Control Group II	K	TOBE	15.328	8.33	24	13.013	8.16	74
	2 & 3	Co-op Primary	6.504	7.60	101	11.278	7.71	104
	4, 5, & 6	CTBS	43.365	38.74	145	34.655		122

The OUSD averages for the Spring, 1975 are the following, as given to the evaluator by the OUSD Research Department in July, 1975:

TABLE 15 OUSD AVERAGES -- SPRING, 1975

GRADE	TEST	READING	MATH
K	TOBE (Lang.)	58.63	56.40
2	Co-op Primary	145.69	147.72
3	Co-op Primary	151.65	155.49
4	CTBS	349.45	374.62
5	CTBS	420.43	412.37
6	CTBS	434.77	428.00

The above averages have been transformed to scaled scores.

The program objective for educational impact predicted that 60 percent of the Santa Fe PTEL students would achieve the OUSD achievement score norms in math and reading in the first program year.

Table 16 reveals the number and percentages of students by grade level that achieved at, below, or above the OUSD achievement averages in reading on the post-test administered in Spring, 1975. Mean reading scores did not differ statistically in four grades: Kindergarten-Santa Fe PTEL was 58.3 percent above the OUSD average, Control Group I was 43.5 percent above OUSD averages, and Control Group II was 54.8 percent above ($x^2(2df) = 1.20$, $p = .55$); Grade 2-Santa Fe PTEL was 40.0 percent above the OUSD average, while Control Groups I and II were 35.1 percent and

32.6 percent above average, respectively (x^2(2df) = .21, p = .90); Grade 5-Santa Fe PTEL was 27.3 percent above the OUSD average, and Control Groups I and II were 34.5 percent and 29.5 percent above, respectively (x^2(2df) = .44, p = .80); Grade 6-Santa Fe PTEL was 43.5 percent above the OUSD average, Control Group I was 61.3 percent above, and Control Group II was 51.0 percent above OUSD averages (x^2(2df) = 2.78, p = .24).

The mean reading scores for the third grade between groups do differ reliably (x^2(2df) = 7.55, p = .02). Santa Fe PTEL was 53.8 percent above the OUSD averages, while Control Groups I and II were 25.9 percent and 51.8 percent above average, respectively. In addition, Grade 4 mean reading scores differ statistically as Santa Fe PTEL was 51.7 percent above OUSD averages, Control Group I was 30.4 percent above, and Control Group II was 62.2 percent above average (x^2(2df) = 5.73, p = .05). As can be seen in Table 16 the Grade 4 mean reading scores failed to achieve OUSD averages by only 10 percent -- a lower percentage than the two Control Groups.

TABLE 16 STUDENTS' READING SCORES IN RELATION TO OUSD AVERAGES
POST-TEST -- SPRING, 1975

GROUP	GRADE	# OF STUDENTS BELOW OUSD AVERAGES	% OF STUDENTS BELOW OUSD AVERAGES	# OF STUDENTS AT OR ABOVE OUSD AVERAGES	% OF STUDENTS AT OR ABOVE OUSD AVERAGES
Santa Fe PTEL	K	10	41.7	14	58.3
	2	6	60.0	4	40.0
	3	18	46.2	21	53.8
	4	14	48.3	15	51.7
	5	8	72.7	3	27.3
	6	13	56.5	10	43.5
Control Group I	K	13	56.5	10	43.5
	2	24	64.9	13	35.1
	3	20	74.1	7	25.9
	4	16	69.6	7	30.4
	5	38	65.5	20	34.5
	6	29	38.7	46	61.3
Control Group II	K	33	45.2	40	54.8
	2	31	67.4	15	32.6
	3	27	48.2	29	51.8
	4	14	37.8	23	62.2
	5	43	70.5	18	29.5
	6	25	16.8	26	51.0

Table 17 reveals the number and percentage of students by grade level that achieved at, below, or above the OUSD achievement averages in math on the post-test given in the Spring, 1975. Mean math scores do not differ statistically in three grades: Kindergarten-Santa Fe PTEL was 45.8 percent above OUSD math averages, Control Group I was 43.5 percent above, and Control Group II was 50.0 percent above OUSD averages ($x^2(2df) = .35$, $p = .83$); Grade 2-Santa Fe PTEL was 40.0 percent above OUSD averages, while Control Groups I and II were 56.8 percent and 44.7 percent above, respectively ($x^2(2df) = 1.56$, $p = .46$); and Grade 4-Santa Fe PTEL was 50.0 percent above averages, Control Group I was 16.7 percent above, and Control Group II was 43.2 percent above ($x^2(2df) = 3.93$, $p = .14$). Grade 6 showed Santa Fe PTEL was 43.5 percent above OUSD math averages, while Control Groups I and II were 70.3 percent and 64.6 percent above, respectively ($x^2(2df) = 5.48$, $p = .06$). This grade level was marginally significant with Control Group I having the highest percentage above the OUSD average. Grades 3 and 5 did differ statistically as follows: Grade 3-Santa Fe PTEL was 25.0 percent above math OUSD averages, while Control Groups I and II were 22.2 percent and 47.4 percent above, respectively ($x^2(2df) = 7.55$, $p = .02$); and Grade 5-Santa Fe PTEL was at the 0.0 percent level, while Control Groups I and II were 37.9 percent and 45.8 percent above math OUSD averages, respectively ($x^2(2df) = 8.22$, $p = .01$).

TABLE 17 STUDENTS' MATH SCORES IN RELATION TO OUSD AVERAGES
POST-TEST -- SPRING, 1975

GROUP	GRADE	# OF STUDENTS BELOW OUSD AVERAGES	% OF STUDENTS BELOW OUSD AVERAGES	# OF STUDENTS AT OR ABOVE OUSD AVERAGES	% OF STUDENTS AT OR ABOVE OUSD AVERAGES
Santa Fe PTEL	K	13	54.2	11	45.8
	2	6	60.0	4	40.0
	3	30	75.0	10	25.0
	4	14	50.0	14	50.0
	5	11	100.0	0	0.0
	6	13	56.5	10	43.5
Control Group I	K	13	56.5	10	43.5
	2	16	43.2	21	56.8
	3	21	77.8	6	22.2
	4	10	83.3	2	16.7
	5	36	62.1	22	37.9
	6	22	29.7	52	70.3
Control Group II	K	37	50.0	37	50.0
	2	26	55.3	21	44.7
	3	30	52.6	27	47.4
	4	21	56.8	16	43.2
	5	32	54.2	27	45.8
	6	17	35.4	31	64.6

Table 18 indicates summary data on the numbers and percentages of students' scores that achieved below, at, or above OUSD averages in reading. The three groups did not differ significantly. Santa Fe PTEL had the highest percentage above the reading OUSD average at 49.3 percent, while the Control Groups I and II were 42.4 percent and 46.6 percent above average, respectively ($x^2(2df) = 1.87$, $p = .39$). It is important at this point to note that the Santa Fe PTEL students' scores failed to achieve prediction levels but overall were within 10+ percent of the predicted improvement. The Control Groups I and II failed to achieve OUSD averages by 18 percent and 14 percent, respectively.

TABLE 18 TOTAL READING SCORE AVERAGES IN RELATION TO OUSD AVERAGES

GROUP	# OF STUDENTS BELOW OUSD AVERAGES	% OF STUDENTS BELOW OUSD AVERAGES	# OF STUDENTS AT OR ABOVE OUSD AVERAGES	% OF STUDENTS AT OR ABOVE OUSD AVERAGES
Santa Fe PTEL	69	50.7	67	49.3
Control Group I	140	57.6	103	42.4
Control Group II	173	53.4	151	46.6

Table 19 shows summary data on the number and percentages of students 'scores that achieved at, above, or below OUSD averages in math. The groups did differ significantly. Control Group I had 48.9 percent above, and Control Group II, with a percentage of 49.4 above, did better than Santa Fe PTEL which had 36.0 percent above District math averages. Santa Fe PTEL failed to achieve the predicted level by 14 percent in math.

TABLE 19 TOTAL MATH SCORE AVERAGES IN RELATION TO OUSD AVERAGES

GROUP	# OF STUDENTS BELOW OUSD AVERAGES	% OF STUDENTS BELOW OUSD AVERAGES	# OF STUDENTS AT OR ABOVE OUSD AVERAGES	% OF STUDENTS AT OR ABOVE OUSD AVERAGES
Santa Fe PTEL	87	64.0	49	36.0
Control Group I	118	51.1	113	48.9
Control Group II	163	50.6	159	49.4

DISCUSSION

The evaluation of the Santa Fe PTEL program revealed that 5 out of 6 of the major program objectives were achieved, some to a greater extent than others.

- Planning and Implementation of start-up activities.

The Project Director and instructional assistants were hired within the specified time schedule. The Project Director ordered various materials for program use and began to develop curriculum materials. The development of curriculum materials was an on-going process in which the teachers also participated.

- Staff training in the charting of student correct and error frequencies in reading and math.

The staff did receive training in the charting of student correct and error frequencies in reading and math. All staff, teachers, and instructional assistants, demonstrated proficiency in charting as measured by a test developed by the Project Director.

- Staff training in setting individual behavioral objectives and mastery criteria for students, and in the general concepts of the individualized management system.

The staff did receive training in pinpointing behavioral objectives for each student and establishing criteria for mastery. They were also trained in the general concepts involved in an individualized management system. The staff was tested at the end of each session regarding each of the training objectives; all teachers demonstrated proficiency in each area. The staff was able to pinpoint behavioral objectives for students by utilizing the established objectives in the reading materials and by using the

Starlin's Curriculum Ladder and Project Math materials for math objectives. There were no long term goals established for students; instead, specific objectives were established as a mechanism to move students through a series of sequential steps. Establishing criteria for the mastery of skills was difficult for teachers. In most instances, proficiency levels differed from student to student, depending on each student's abilities in a particular academic area. An attempt was made by teachers to raise a student's skill rate to their *automatic rate*. Obviously, this took time and several trial tests to establish individual criteria for mastery. For example, using a one-minute timed test, one student's proficiency level may be 40 words/minute, while another student's mastery may be 70 words/minute. This is an area on which the staff will be working more in the next program year. The problem involved in this task is whether an individualized criteria is the best approach, or whether an approach to normalize criteria for grade levels is best. It becomes a complex issue to establish a single criterion for a group of students who are each progressing at a different rate and who each display different abilities.

- Staff training in reinforcement principles.

Training sessions for the staff were held for the purpose of establishing reinforcement techniques to use with students during the late Spring, 1975. Because of time limitations in the first program year, the staff placed its priorities in the area of developing appropriate curriculum materials and revising curriculum plans. During the first year of operations, time was not available to implement all of the planned reinforcement techniques

in the classrooms as the staff would have liked. Many of the techniques learned in staff training regarding reinforcement principles will be implemented to a greater extent in the next program year.

Another important point regarding the staff training is the fact that the training sessions were held in the afternoons after school was over, and beyond the teachers' scheduled work day. Although no staff member indicated to the evaluator that this was a major problem, no funds were provided to teachers for this training time. It was suggested by the staff that an alternative for the staff training time problem might be a modified school day. The feasibility of this has not been researched by the staff, but the suggestion seems to be a good one.

- Sequential ordering of behavioral objectives in the math and reading curricula.

The staff adapted their reading and math curricula to Precision Teaching. A variety of materials were used at Santa Fe this past year to teach reading and math. The adaptation of these materials to Precision teaching was a lengthy process in which the staff first studied the curriculum materials and then evaluated them in terms of utilization. Next, they organized the materials into behavioral objectives in sequential order of difficulty, so that students could move from one phase to the next at his/her own rate. The math curriculum was revised first and the reading curriculum second. Although there were variations between classrooms, the staff spent several months working in

this area. In addition, the staff began to adapt the curriculum in social studies, spelling, and other academic subject areas, to Precision Teaching for use in future program years.

- The attainment of District achievement score norms in math and reading by 60, 80, and 100 percent of PTEL students in program years 1, 2, and 3 respectively.

The Santa Fe PTEL program failed to meet this objective. Although the Santa Fe PTEL group only missed achieving the 60 percent at-norm level by about 10 percent in reading, the two Control Groups were less successful in bringing students up to the district's Spring, 1975 norms. Three grade levels in Santa Fe PTEL (K, 2, and 3) also produced a higher percentage of students scoring above OUSD averages, relative to their respective Control Groups.

Santa Fe PTEL's objective for math scores was missed by approximately 14 percent. The Grade 4 math scores also indicated a greater tendency toward the OUSD averages than did either of the Control Groups. It appears that overall, there was more progress in reading scores than in math scores by the students in the Santa Fe PTEL program.

It must be pointed out here that the test results presented in this report should be interpreted with caution as a means of evaluating the impact of the Santa Fe PTEL program. As already stated, PTEL methods were probably not implemented effectively in the classrooms for more than four to five months. This was the first year of operation and staff training had to be put in place prior to implementing the PTEL methods in the classrooms. It might also be assumed that the PTEL methods in the upper elementary

grades were not fully operational for certain mathematical concepts. The Starlin's Curriculum Ladder was utilized by the staff, but did not include items in the area of fractions, measurement and application, geometrical concepts, etc. The CTBS did cover these content areas. The staff reported that they are in the process of developing materials in these concept areas that can be used next year with the PTEL approach.

In the area of reading, it can be assumed (based on staff reports) that similar reading materials were used throughout Santa Fe classrooms. Therefore, the difference in an instructional approach to reading between Santa Fe PTEL and Control Group I teachers was the PTEL approach to setting behavioral objectives, testing, charting progress, etc. As already seen in this report, some grade levels in the Santa Fe PTEL program did significantly better in reading than students in the Control Groups.

Perhaps standardized tests should not be used as a gauge of program value during the first year of operation. This would seem especially true in the case of Santa Fe's PTEL program due to the amount of time required by staff and students for process-related activities that were necessary to the initiation of the new program. This concern for analyzing standard test scores as a part of the program evaluation was expressed by the evaluator a priori; i.e., before post-tests had even been administered. It is commonplace for programs that are instituting innovative educational practices to require a period of incubation before student gains become apparent. Even a relatively inferior standing is frequently attained by students in innovative

programs during the first implementation phase (e.g., Kenny, 1975). This situation is generally felt to be tolerable if improved student outcomes begin to accrue shortly thereafter. Thus, the reading and math skills of PTEL students at Santa Fe should be observed closely during the early months of the 1975-1976 academic year and program changes considered, if improvement does not begin to appear.

One problem encountered in the analysis of achievement test scores was the loss of data. There were many students with only pre-test scores and no post-test scores, or vice versa. Table 20 reveals the difference in the number of students with pre- or post-test scores. To further complicate the analysis, a fairly large number of students took only some of the sub-tests rather than all sub-tests, and therefore did not have total reading or math scores. In addition, some students' names appeared twice on the computer print-outs received from the OUSD Research Department. For the above stated reasons, caution should again be used when interpreting the test scores.

A review of Table 11 in the Results section of this report reveals student progress in reading and math. The EMR students achieved an average of 15 math items and completed 2 S.R.A. workbooks. It seems commendable that children who are educationally mentally retarded, could have made such progress. The data also shows that educationally handicapped students (EH) progressed through an average of 18.5 mathematical items. The table also indicates progress for other students. This data is helpful to staff, students, and others interested in the extent of

classroom achievement made by students. EMR and EH students are not normally tested by standardized tests as are the other students. Thus, the data summarized from student behavior charts is one of the few available pictures of these students' progress and it should assist the teachers who will be working with these students next year.

- Student Motivation

While student motivation for learning was not articulated as a major program objective, it is centainly one of the impacts of the PTEL approach. It is important to mention at this point that the data reported regarding attendance and tardiness, as well as office referrals, should be viewed with caution. It should not necessarily be interpreted that students were not motivated by the PTEL program as a result of the above mentioned data. These were the only indices reviewed by the evaluator and conditions beyond the staff's control could have existed, such as turbulent weather conditions, the flu (or other contagious diseases), an epidemic, or family problems, that could have caused low attendance or tardiness. A major concept involved in the PTEL approach is the motivation of students to learn and therefore, to progress at a higher rate academically. The concepts involved in the PTEL method, such as the testing and charting of student progress, the individualized management system, and reinforcement principles of learning, all contribute to a student's motivation to learn.

TABLE 20 TOTAL NUMBER OF SANTA FE STUDENTS WITH PRE-, POST-, OR NO ACHIEVEMENT TEST SCORES

GRADE	# OF STUDENTS WITH PRE-TEST SCORES	# OF STUDENTS WITH POST-TEST SCORES	# OF STUDENTS WITH NO ACHIEVEMENT TEST SCORES
K	58	66	28
2	56	60	14
3	79	73	16
4	61	60	16
5	75	77	10
6	100	111	12
TOTALS:	429	447	96

RECOMMENDATIONS

This evaluation of the Santa Fe Precision Teaching for Effective Learning Program, 1974-75, points to recommendations for future programs and for future evaluations. The recommendations assembled reflect the evaluator's viewpoint, but incorporate numerous staff suggestions.

Program Recommendations

1) Provide additional staff training sessions (conducted by professional consultants) in the following areas:

   a) Goal-setting: How to establish long-term goals for student learning and performance, and how to pinpoint behavioral objectives for each student.

   b) Establishing criteria for the mastery of basic skills for students

   c) Implementing behavior modification or behavior incentive approaches; How to identify and utilize reinforcement techniques for essential desirable classroom behaviors as well as for higher order cognitive skills.

These workshops for staff should be followed up with technical assistance to teachers in their individual classrooms in order to help them effectively implement the concepts listed above.

2) Provide additional work which is required for the development of curriculum materials in order that they can be used with the PTEL approach. Specifically, math materials and tests are needed in the areas of measurement, geometry, functions, and problem solving. An alternative to developing these materials is to review additional commercially available materials which might already suit the program's purpose.

3) Establish a "Modified Day" for Precision Teaching classrooms for staff training workshops and development of materials.

4) Devise and utilize simplified progress charts so that all students can learn to chart their own behavior.

5) Provide training for all new students (including EMR, EH, and Kindergarten) in testing themselves and charting their own progress.

6) Encourage and plan a concentrated effort by all staff in order to develop and implement parent involvement. Possibly some of the approaches mentioned by the staff such as telephone calls, home visits, etc. will help to encourage more parent participation. Perhaps, instructional techniques could be developed that parents could use at home with their children.

Evaluation Recommendations

1) A review of appropriate indices for assessing student motivation for learning and school participation should be performed. Perhaps a comparison of student attendance, tardiness, and disciplinary office referrals could be conducted over a three-year period as one measure of student motivation. A survey of student attitudes toward learning could also be conducted on a pre-, post- basis in order to determine whether student self-image is affected during a year of participation in the PTEL program.

2) A survey of student opinions should be performed in order to gauge participant views of the PTEL approach.

3) Summary Behavior Charts of students should be revised so that the data could be appropriately used to measure academic growth and to determine the impact of the PTEL program at each grade level. If specific behavioral expectations for each student were developed, these Summary Behavior Charts would permit an individualized assessment of the PTEL program's ability to achieve student-specific objectives during the next program year.

4) A review of achievement test administration should be made. Student by student documentation should be kept of the frequency and reasons for children transferring in and out of Santa Fe School, or for other reasons related to the lack of pre- and post-test achievement scores. In addition, the circumstances leading to partial test scores should also be examined. There is a general need for uniform, complete, unbiased, and reliable data in educational settings where program evaluation is required. Perhaps Santa Fe should consider planning for some of these testing needs prior to the 1975-76 academic year so that their first year of full-scale PTEL operation will be accompanied by test data that is relatively less restricted in interpretation than is the data from the current year.

APPENDIX A

PROJECT DIRECTOR QUESTIONNAIRE

I. IDENTIFYING INFORMATION

1) Briefly describe the school, its history, population, the facility, the community environment, etc.

2) Briefly describe the classroom (environment, size, setting, etc.) Indicate if the Precision Teaching classrooms are different in any way from the others.

3) How was your school selected to participate in the Precision Teaching Program?

4) How were teachers selected to participate in the Precision Teaching Program?

5) How were students selected who participated in the Precision Teaching Program?

6) Describe the curriculum planning process for the Precision Teaching Program and indicate implementation dates for major activities.

7) What are the main things that you had hoped to achieve this first program year?

8) Have you been trained in or used the following prior to administering this program? Please be specific.

a) Behavior incentives approach to learning

_____ training _____ used

_____

_____

_____

_____

_____

b) Precision Teaching approach to testing and charting

_____ training _____ used

_____

_____

_____

_____

_____

_____

c) Establishing behavioral objectives

_____ training _____ used

_____

_____

_____

_____

_____

If so, what are your impressions of the impact of these concepts on students learning abilities, both in reading and math.

_____

_____

_____

_____

_____

_____

_____

STAFFING

1) Identify all Precision Teaching staff and specify responsibilities of each:

Position	Responsibilities	Ethnicity	Length of time in P.T. Program

2) Identify all support services at Santa Fe and specify if these services are offered only to Precision Teaching staff and students or only to non-Precision Teaching staff and students.

3) How does the Precision Teaching Program link up with other services or programs?

4) Is there adequate staffing for the Precision Teaching Program?

_____ yes _____ no Please explain.

5) How have the Precision Teachers generally responded to the Precision Teaching approach?

6) How do the other teachers at Santa Fe (not in Precision Teaching) view the Precision Teaching approach?

STUDENT POPULATION

Please complete the following for Santa Fe School (1974-1975).

	PRECISION TEACHING	NON-PRECISION TEACHING
# of classes		
# of students		
% of ethnicity		
economic level		
past performance level		
% of bilingual		
% of handicapped		
turnover rate		

Specify if any of the above areas have affected the Precision Teaching Program in a special way.

II. STAFF DEVELOPMENT

1) Were all staff members adequately trained to:

	Yes	No
(a) pinpoint behavioral objectives for each student		
(b) establish criteria for mastery		
(c) list components of individualized management system		
(d) chart correct and error frequencies		
(e) identify effects of reinforcements punishment		

2) Please describe the Precision Teaching in-service training program, indicate dates, problems encountered, etc. (review in-service records)

3) How did you assess the effectiveness of the in-service training for your staff? (by teacher tests provided to us?)

4) Describe how results of teacher tests were used as diagnostic prescriptive tools for teacher training. (Obtain results for these tests)

III. INSTRUCTIONAL PROGRAM/MATERIALS

1) Please describe the reading and math curriculum. (Review the curriculum objectives)

2) Are all students involved in charting and taking timed tests? _____ yes _____ no Please explain.

3) What materials are currently being used to implement the Precision Teaching program? Please indicate which of these are effective or not.

4) Was there sufficient quantity of instructional materials available to implement the Precision Teaching program?

_____ yes _____ no

IV. COMMUNITY/PARENT INVOLVEMENT

1) What activities were planned and implemented to involve the community in the Precision Teaching program?

2) Do you feel the parental involvement this year was adequate? _____ yes _____ no Please explain.

3) What was the general response of the parents to the Precision Teaching program?

V. IMPACT OF PRECISION TEACHING

What impact do you feel this program has had on students, teachers, and parents? (Indicate amount and supporting evidence wherever possible.)

Beneficiaries	Quant. Measures of Impact		Source (i.e., indicator of impact)
	% Affected	Amount	
Student Performance			
Student Attitudes			
Teacher Behavior (i.e. teaching style--not specific training objectives)			
Teacher Attitudes			
Parent Behavior			
Parent Attitudes			

In your opinion, does the student program justify the additional time spent on in-service training, paperwork, etc.?

VI. What changes or recommendations would you make for the program in the following areas?

1) Curriculum Planning and Implementation

2) Staffing

3) Staff Development

4) Instructional Program/Materials

5) Community/Parent Environment

6) Program and Student Impact Evaluation

7) Additional Comments

APPENDIX B

STAFF SURVEY FORM

SANTA FE PRECISION TEACHING PROGRAM

1974 - 1975

The attached survey is intended to obtain teacher judgements on several aspects of Santa Fe School's Precision Teaching Program. These judgements form one of several parts of the official program evaluation for the Oakland Public Schools.

Since teachers are most directly and intimately knowledgable about the effectiveness of any new instructional effort, we are requesting your assistance in assessing the progress and impact of the Precision Teaching Program. We are interested in your opinions, observations, and judgements about the nature and effect of the program as it relates to your students, their parents, and you as a teacher. Please be frank in your responses. All answers will be treated with the utmost confidentiality. No information identifying individuals will be disclosed. Thank you for your help.

Classroom Grade Level_____

SANTA FE PRECISION TEACHING PROGRAM

STAFF SURVEY FORM

PLEASE MARK THE BOX WHICH REFLECTS YOUR OPINION MOST CLOSELY FOR EVERY STATEMENT.

I. ADMINISTRATION AND ORGANIZATION	STRONGLY AGREE	AGREE SOMEWHAT	DISAGREE SOMEWHAT	STRONGLY DISAGREE
1. The program was well planned.				
2. The timetable of the program was accurate and included all necessary activities.				
3. The program goals are well defined.				
4. The program goals are realistic.				
5. The program is effectively administered.				
6. The staff gets along well with the Project Director.				
7. The Project Director is responsive to staff needs.				
8. The program is well coordinated with other services within the school.				
9. The program has correctly allocated its funds for staff, materials, and other expenses.				
10. Staff has been able to effectively evaluate the program and institute changes on an on-going basis.				

COMMENTS:

II. TEACHER TRAINING

	STRONGLY AGREE	AGREE SOMEWHAT	DISAGREE SOMEWHAT	STRONGLY DISAGREE
1. The training developed specific skills and knowledge that related closely to what teachers needed to implement the Precision Teaching Program.				
2. Because of the training, teachers are well prepared in the following areas:				
a. Clearly understanding the individual management system.				
b. Charting the frequency of correct or error answers.				
c. Setting behavioral objectives for each student.				
d. Identifying appropriate activities for specific students at particular points in their learning process.				
e. Setting mastery criteria for each student.				
f. Assessing students' mastery of a stated objective.				
g. Creating or implementing appropriate behavior management techniques.				
3. Training sessions were generally held at a convenient time.				
4. There was an adequate number of training sessions.				
5. Staff effectively planned the Precision Teaching Program and cooperatively implemented it.				

	STRONGLY AGREE	AGREE SOMEWHAT	DISAGREE SOMEWHAT	STRONGLY DISAGREE
6. Staff visits to Precision Teaching classrooms in other schools was a very helpful teacher training approach. (please note if these visits did not occur)				
7. The feedback given to teachers during training actually brought about improvements in teachers' performance and program implementation. (please note if feedback was not given)				

COMMENTS:

III. INSTRUCTIONAL APPROACH

	STRONGLY AGREE	AGREE SOMEWHAT	DISAGREE SOMEWHAT	STRONGLY DISAGREE
1. Precision Teaching is the optimum approach to improving a student's reading ability.				
2. Precision Teaching is the optimum approach to improving a student's mathematical abilities.				
3. There is sufficient time in the Precision Teaching program to plan weekly activities.				
4. Precision Teaching allows me to teach to small groups better.				
5. Precision Teaching allows me to teach to individual students better.				
6. Precision Teaching has actually improved my personal teaching skills.				
7. Precision Teaching's behavior incentive approach has been especially effective in improving math and reading skills.				
8. The recording, charting, and prescribing are not unduly burdensome.				

9. The instructional assistants were very helpful in the following ways:

a. conducting small group or individual student activities.			
b. charting student progress.			
c. setting mastery criteria.			

(continued on next page)

III. INSTRUCTIONAL APPROACH-page 2

	STRONGLY AGREE	AGREE SOMEWHAT	DISAGREE SOMEWHAT	STRONGLY DISAGREE
d. setting learning objectives				
9. Students were capable of learning to utilize Precision Teaching instruments effectively.				
10. Precision teaching has increased teachers' enthusiasm about teaching math and reading.				

11. Are your students' aware that they are involved in a special program? _____Yes _____No

COMMENTS:

IV. MATERIALS

1. Please indicate how effectively each of the following reading/language arts materials are (if used) in the Precision Teaching Program:

	VERY EFFECTIVE	SOMEWHAT EFFECTIVE	NOT EFFECTIVE	DO NOT USE
a. Teacher Prepared Materials				
b. Sullivan				
c. S.R.A. Skill Boxes				
d. Harper Row Readers or Work Books				
e. Bank Street				
f. Lippincott				
g. Sounds of Language				
h. MacMillan				
i. Houghton-Mifflin				
j. Other materials:				

COMMENTS:

IV. MATERIALS -page 2

2. Please indicate how effective each of the following mathematics materials are (if used) in the Precision Teaching Program.

	VERY EFFECTIVE	SOMEWHAT EFFECTIVE	NOT EFFECTIVE	DO NOT USE
a. Project Mathematics				
b. Wirtz Materials (C.D.A. Math)				
c. Houghton-Mifflin Text (Modern School Mathematics)				
d. Addison Wesley text (Elementary School Math)				
e. Franklin Materials (Patterns and Puzzles, etc.)				
f. Individualized Program (Specify)_____				
g. Computation Practice Kits				
h. Math Lab Manipulables				
i. Commercial Worksheets				
j. Teacher-Made Worksheets				
k. Physical Number Aids				

(continued on next page)

IV. MATERIALS - page 3

	VERY EFFECTIVE	SOMEWHAT EFFECTIVE	NOT EFFECTIVE	DO NOT USE
l. Commercial Drill and Practice Games				
m. Teacher-made Drill and Practice Games				
n. Tapes, Film Loops, etc.				
o. Mathematics Library Books				
p. Other Materials (Specify)_____ _____				

COMMENTS:

3. Are there sufficient instructional materials for each student?

_____yes _____no

COMMENTS: _____

_____

_____

_____

4. Are there sufficient instructional materials <u>of</u> <u>the</u> <u>type</u> that you need to effectively implement Precision Teaching?

_____yes _____no

COMMENTS: _____

_____

_____

_____

V. STUDENTS' PROGRESS

FOR EACH ITEM BELOW, PLEASE MARK THE RESPONSE WHICH MOST CLEARLY REFLECTS YOUR OBSERVATION OF CHANGES DURING THIS SCHOOL YEAR, IF ANY. IF A QUESTION DOES NOT APPLY TO YOUR PARTICULAR GRADE LEVEL, PLEASE MARK THE BOX ENTITLED "NOT APPLICABLE."

1. Indicate your students' growth in the following mathematical areas:	Greatly Improved	Somewhat Improved	Doesn't Need Improvement	Little or no Change/ Improvements Needed	Not Applicable to this Grade
a. Math readiness, counting					
b. Clock arithmetic					
c. Addition, subtraction with whole numbers					
d. Structure & properties (greater, less than, or equal)					
e. Problem-solving, addition & subtraction					
f. Geometry, recognition of shapes					
g. Measurement & application (e.g., time, size, temperature)					
h. Multiplication, Division with Whole numbers					
i. Fraction concept					
j. Operations with fractions					
k. Decimals & percents					
l. Problem-solving, estimation, averages, ratio, weight, etc.					
m. Graphs & functions					
n. Sets & logical reasoning					
o. Geometry, practical application of concepts, i.e. prisms, circles, lines, etc.					

V. STUDENTS' PROGRESS-page 2

2. Indicate your students' growth in the following reading areas:

	Greatly Improved	Somewhat Improved	Doesn't Need Improvement	Little or no Change/ Improvements Needed	Not Applicable to this Grade
a. Word Analysis					
1) Left to right sequencing					
2) Compound words, suffixes, prefixes, and roots					
3) Sight recognition of whole words					
4) Sentence structure					
5) Consonants					
6) Short Vowels					
7) Long Vowels					
8) Contrasting Spelling Patterns (bat, mat, fat)					
9) Syllabication					
10) Word formation					
b. Vocabulary Development					
1) Synonyms and Autonyms					
2) Word Origins					
3) Words from content area subjects (math, science, social studies)					
4) Crossword puzzle skill					
c. Reading Comprehension					
1) Following simple directions					

(continued on next page)

V. STUDENTS' PROGRESS-page 3

	Greatly Improved	Somewhat Improved	Doesn't Need Improvement	Little or no Change/ Improvements Needed	Not Applicable to this Grade
2) Identifying main ideas					
3) Recalling details					
4) Identifying cause & effect relationship					
5) Determining author's motive					
6) Analyzing content					
7) Understanding riddles					
8) Using dictionaries					
9) Summarizing a story					
10) Outlining					
11) Reading with speed					
12) Reading maps, tables, graphs, etc.					
d. Language Arts					
1) Spelling					
2) Grammar					
3) Punctuation					
4) Handwriting					
5) Listening skills					
6) Creative writing					

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V. STUDENTS' PROGRESS-page 4

3. Indicate your students' growth in the following areas:

	Greatly Improved	Somewhat Improved	Doesn't Need Improvement	Little or no Change/ Improvements Needed	Not Applicable to this Grade
a. Your students' pleasure in reading					
b. Your students' use of the library					
c. Your students' feelings about their own reading abilities					
d. Your students' appreciation of reading skills in others					
e. Your students' feelings about their own math skills					
f. Your students' appreciation of math skills in others					
g. Your students' attendance and tardy rates					
h. Frequency of conflicts & negative behavior exhibited by students					
i. Your students' performance on daily homework assignments.					

COMMENTS:

VI. PARENT/COMMUNITY INVOLVEMENT

1. How many parents visited or volunteered in your classes this school year?

_____frequently _____occasionally

2. How many parent-teacher conferences did you have during the year? _____

3. Were the parent-teacher conferences more effective as a result of the Precision Teaching approach?

_____yes _____no

4. How many parent workshops were held to explain Precision Teaching procedures? _____

5. In your opinion, how do parents like the Precision Teaching approach?

COMMENTS:

VII. What factors do you feel have contributed most to the success (and/or lack of it) of Precision Teaching that you have cited above?

VIII. What changes or improvements would you recommend for this program?

Administration

Training

VIII. (continued)

Instructional approaches - materials

Curriculum Development and/or Planning

Parental/Community Involvement

IX. Please briefly describe your instructional approach utilizing the Precision Teaching method:

X. Any other comments: